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Curating SIO Geological Collections

Wolf H. Berger and Annika Sanfilippo
Scripps Institution of Oceanography
University of California, San Diego
La Jolla, CA 92093-0220

wberger@ucsd.edu
Phone: (619)534-1830
Fax: (619)534-0784

asanfilippo@ucsd.edu
Phone: (619)534-2049
Fax: (619)534-0784

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Long-Range Objectives

The purpose of curating the Geological Collections at Scripps Institution of Oceanography is: (1) to receive, maintain and preserve the deep-sea sediments and dredge hauls under conditions that will minimize their deterioration, (2) to collect and disseminate data about core and dredge samples to the geological community and the community at large, (3) to make appropriate research materials available for areas of investigation such as ocean history, paleoclimate, continental weathering processes and plankton evolution, and (4) to promote the educational goals of SIO and UCSD.

Effective curating helps investigators in many ways. For example, a new investigation can be based largely on existing cores and dredge hauls, thus saving or reducing the cost of mounting a special-purpose collecting expedition, and each investigator benefits by being able to place his/her results precisely in the context provided by earlier investigators. We use a variety of databases to store and retrieve information on our collections and the research results derived from them.

The activities toward achieving these objectives will continue through the period of the current proposal. The directions and scope of the purely curatorial tasks will remain much the same as during the past. SIO Geological Collections will acquire new research and teaching materials from several recently retired principal investigators. Another long-range goal is to re-curate numerous samples collected in the 1950s to ensure their continued accessibility and future usefulness.

Progress during the period October 1997 through September 1998

The size of the collection as of 30 September 1998:

6348 Cores	2299 Dredge Hauls	498 Grab Samples
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Geological material acquired during this period comes from four legs of two expeditions. We are currently in the process of acquiring an extensive manganese nodule collection from Dr. G. Arrhenius, SIO.

Major building construction on campus requires temporary relocating of many samples as old laboratories are destroyed. The Geological Collections will provide temporary curatorial service for both refrigerated and room temperature samples.

Number of samples distributed during the period October 1997 through September 1998:

To SIO researchers	657
To researchers outside SIO	567

Disseminating information on the Collections

The main method by which descriptions of our cores and dredge hauls are made available to the scientific community is through the National Geophysical Data Center (NGDC) in Boulder, Colorado. These databases include preliminary descriptions and geographic information in NGDC format.

Information on the following expedition has been submitted to NGDC.

A2-131-10 – Atlantic II (1994) – core data revised, reformatted, upgraded and resubmitted to NGDC (March 1998).

Data for the following 11 cruises, previously submitted to NGDC, Downwind (DWB), Downwind (DWH), Fanfare (FANB), Fanfare (FANHMS), Nova (NOVA-A), Show (SHOW-H), Tasaday (TSDY), Wahini (WAH), Chinook (CK), Circe (CIRC) and Deloneer (DELO) were slightly modified to conform to an upgraded NGDC Data presentation, and placed into the Core Curators' database (March 1998).

The list of cruises for which we have submitted data to NGDC is short. The reason for this is that we anticipate revisions to the core-description format during the upcoming Curatorial meeting at Texas A&M University, October 1998. Thus, we do not plan to submit to NGDC the nearly completed database for the following cruises until the data-input format is stabilized.

Corner 02 (CRNR02) 1998: 6 cores
Tunes 4 (TUNE04) 1991: 8 dredge hauls
Tunes 6 (TUNE06) 1991: 36 dredge hauls
Tunes 7 (TUNE07) 1991: 40 dredge hauls
R/V T. Thompson Cruise 37 (TN037) 1994: 14 dredge hauls
Panorama 1 (PANR01) 1998: 53 dredge hauls
Panorama 4 (PANR04) 1998: 92 dredge hauls
Panorama 6 (PANR06) 1998: 6 dredge hauls

Improved Sediment Classification and Digital Core Descriptions

During the past year we have developed a sediment classification (simplified from the ODP system) and a new electronic visual-core-description format. The proposed classification, which encourages consistent sedimentological data input into the NGDC database, will be discussed at the upcoming Curatorial meeting in October (1998) at Texas A&M University. The new electronic visual descriptions combine digitized core photos, graphic lithologic columns, and verbose underway and descriptive data on a single page. The completed visual-core-description may be transmitted electronically to interested researchers.

We have begun collecting and entering data for the cruise, CATO, into this new electronic format.

The Geological Collections database resides on the SIO Geological Collections Web page. A link to the searchable database at NGDC can be accessed from the SIO Geological Collections Web page found at:

<http://gs.ucsd.edu/gc/>

Educational Services

The assistant curator conducted tours and lectured on the marine sediments and rocks to several groups of visitors. Students, instructors, scientists, engineers, and docents were included in the 295 visitors. Students visited from elementary and middle schools, high schools, community colleges and universities as well as individuals from corporations and the Birch Aquarium at Scripps.

New publications based on samples distributed from the SIO Geological Collections:

Berger, W. H. and Wefer, G., 1996. Explorations into the past: paleoceanographic studies in the South Atlantic. In: G. Wefer, W. H. Berger, G. Siedler and D. J. Webb (Editors), *The South Atlantic: Present and Past Circulation*. Springer-Verlag, Berlin Heidelberg, pp. 363-410.

Stott, L. D. and Tang, C. M., 1996. Reassessment of foraminiferal-based tropical sea surface $\delta^{18}\text{O}$ paleotemperatures. *Paleoceanography*, 11(1): 37-56.

Biondi, F., Lange, C. B., Hughes, M. K. and Berger, W. H., 1997. Inter-decadal signals during the last millennium (AD 1117-1992) in the varve record of Santa Barbara basin, California. *Geophysical Research Letters*, 24(2): 193-196.

Bollmann, J., 1997. Morphology and biogeography of *Geophyrocapsa* coccoliths in Holocene sediments. *Marine Micropaleontology*, 29: 319-350.

Castillo, P. R., Natland, J. H., Niu, Yaoling and Lonsdale, P. F., 1998. Sr, Nd and Pb isotopic variation along the Pacific-Antarctic rise crest, 53-57°S: Implications for the composition and dynamics of the South Pacific upper mantle. *Earth and Planetary Science Letters*, 154: 109-125.

Trego, K. D., 1998. An offshore habitat for an Easter Island bivalve. *Journal of Conchology*, 36(1).

Herbert, T. D., Schuffert, J. D., Thomas, D., Lange, C. B., Weinheimer, A. , Pele-Alampay, A. and Herguera, J. C., 1998. Depth and seasonality of alkenone production along the California margin inferred from a core top transect. *Paleoceanography*, 13(3): 263-271.

Zhu, P. and MacDougall, J. D., 1998. Calcium isotopes in the marine environment and the oceanic calcium cycle. *Geochimica et Cosmochimica Acta*, 62(10): 1691-1698.